

Introduce Yourself

What is Marine Debris?

Marine Debris – “Any manufactured or processed solid waste material that enters the marine environment from any source.”



Marine debris is essentially litter that ends up in the ocean or marine environment.

Debris is everywhere – found around every major body of water on the planet, and below water as well.

Marine Debris is a global pollution problem that impacts human health and safety, endangers wildlife and aquatic habitats, and costs local & national economies millions in wasted resources and lost revenues.

Sources of Marine Debris



- Storm water discharges
- Combined sewer overflows
- Beach visitors
- Ships and other vessels

- Solid waste disposal and landfills materials such as garbage and medical waste
- Offshore oil platforms
- Industrial activities
- Illegal dumping or littering



Photo Credit: Ocean Conservancy

US EPA, August 2002. *Assessing and Monitoring Floatable Debris*, Washington, D.C. p. 2-2.

Litter and trash arrive in our waterways in a number of different ways. Trash on our beaches and shorelines can be a result of faulty sewer or storm water discharges, careless beach-goers, illegal dumping, or fishing-related activities.

Approximately **20%** comes from
ocean-based sources

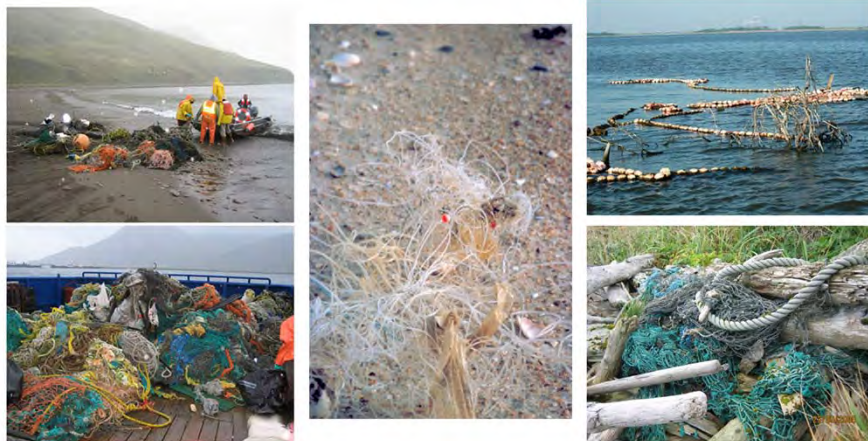


Photo Credit: NOAA Marine Debris Program , Ocean Conservancy

Many people assume that if trash exists in the ocean, it must be that fishermen and the shipping industry is to blame. But in fact, only 20% of the items found in the ocean can be linked to ocean-based sources, like commercial fishing vessels, cargo ships (discharge of containers and garbage), or pleasure cruise ships.

Approximately **80%** comes from
land-based sources



The remainder (80%) is due to land-based sources, like litter (from pedestrians, motorists, beach visitors), industrial discharges (in the form of pellets and powders), and garbage management (ill-fitting trash can lids, etc).

So...What Is It Made Of?

Shoreline Debris (i.e. found on beaches and shores)
is mostly **plastic**

Item	Count	Percentage
Cigarettes/Cigarette Filters	217,423	35.23%
Food Wrappers/Containers	94,182	15.26%
Caps, Lids	48,225	7.81%
Bags (Plastic)	43,783	7.09%
Cups, Plates, Forks, Knives, Spoons	23,990	3.89%
Straws, Stirrers	22,201	3.60%
Glass Beverage Bottles	19,902	3.22%
Beverage Bottles (plastic - 2 liters or less)	19,592	3.17%
Bags (Paper)	19,450	3.15%
Beverage Cans	13,628	2.21%
Top Ten Total	522,376	84.64%

Statistics from California Coastal Cleanup Day 2012, California Coastal Commission and Ocean Conservancy

When we look at what this trash is made of, we find that most of it is plastic. Based on data collected at Coastal Cleanup Day in 2011, 60 percent of shoreline debris (i.e. was collected from beaches and shorelines in CA) is composed of plastic.

So...What Is It Made Of?

Ocean Debris

Plastic accounts for over 3/4 of all debris found in the marine environment



Photo Credit: 5 Gyres Institute



In the ocean, this number is even higher. Plastic accounts for over 75% of items found in the open ocean, and 90% of litter found floating on the surface is plastic.

Plastic is prevalent in at all depths, from the surface of the ocean through the water column and in sediments (Southern CA Coastal Water Research Project); however, much more on surface than sub-surface.

This can have huge impacts on ocean and human health, as we'll discover in just a minute.

Impacts of Marine Debris

Hazard to **Human Health** and Safety



Marine debris is a problem for many reasons. First, these hazardous items present a danger to human health. Nails, glass, syringes on the beach can cause physical harm to beach-goers. Additionally, trash in our waterways increases the amount of pathogens and chemicals in the water, leading to water quality issues.

Impacts of Marine Debris

Damage to **Economy**



Marine debris is also a hazard to California's economic health. Fishing line and nets can entangle propellers causing damage to boats. Unsightly trash on the beaches detracts from tourism. In September of 2012, the US EPA (Region 9) released a report, titled *The Cost to West Coast Communities of Dealing with Trash, Reducing Marine Debris*, in which it is projected that "West Coast communities are spending more than \$520,000,000 – over one half billion dollars – each year to combat litter and curtail marine debris." This amount includes direct costs through beach and waterway cleanup, street sweeping, installation of storm-water capture devices, manual cleanup of litter, and public anti-littering campaigns; but excludes indirect costs such as loss of tourism and loss to industry (through lost fishing lines, depleted fisheries, etc). Read more at <http://www.epa.gov/region9/marine-debris/pdf/WestCoastCommsCost-MngMarineDebris.pdf>

For a similar comparison, the Asia-Pacific Economic Cooperation released a report valuing different marine debris abatement measures and found that the loss of tourism from littered beaches in APEC region was \$622 million/year. The damage to Fishing Industry totaled \$364 million/year. The damage to the shipping industry was \$279 million/year, and the total cost of marine debris on APEC Region totaled 1.265 billion/year.

* APEC Region does not include California, but an estimate can be drawn from the comparison. The APEC Region has a \$207 billion marine economy; California has a \$46 billion marine economy.

Impacts of Marine Debris

Dangers for **Marine Wildlife**



Photo Credit: Andy Colling, NOAA Office of National Marine Sanctuaries



Photo Credit: Ocean Conservancy



Marine debris also causes hazards to marine wildlife through ingestion and entanglement. 36% of green sea turtles washed up on shores of Australia had died from marine debris. 100% of Laysan Albatross carcasses on Midway Atoll in the Northwest Hawaiian islands are filled with plastic pieces. It has been estimated that albatross feed their chicks approximately 10,000 lbs of marine debris annually on Midway.

In Puget Sound, more than 200,000 marine animals, representing over 200 species, were killed as by-catch since 2002. “Average” Fulmar (a bird) in the North Sea flies around with 0.6 grams of plastic in its stomach, which equates to 30 grams of plastic in a human-size stomach – basically a full lunchbox! There is increasing evidence of the transfer of toxic, endocrine-disrupting chemicals from plastics in the marine environment to tissues of animals that feed on them (and potentially to us, as we eat fish and other marine animals).

Impacts of Marine Debris

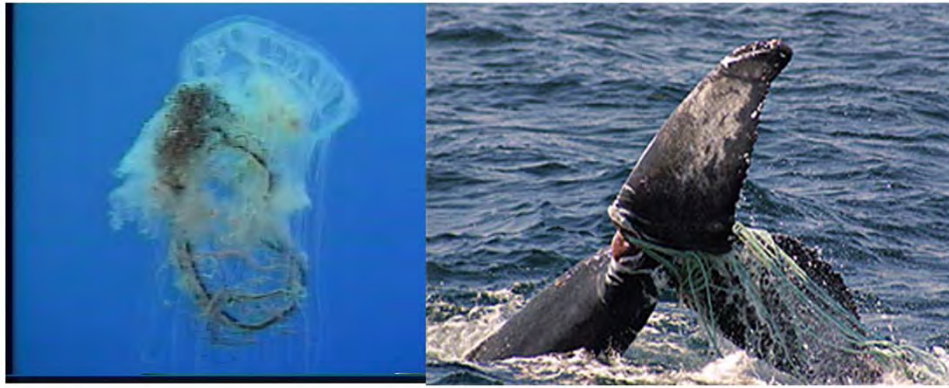
100% of Laysan Albatross Impacted (NOAA)



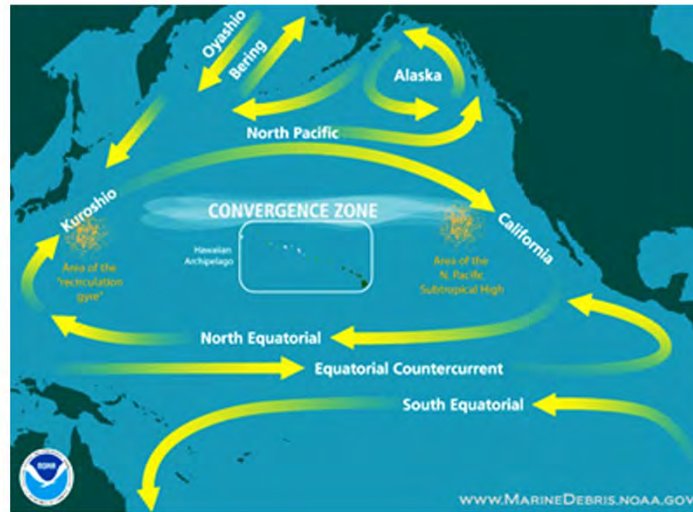
Laysan Albatross live on islands of the Northwest Hawaiian Island Chain (Midway Atoll), a very remote location. They scavenge for food on the ocean's surface. Adults find and eat brightly colored plastic, mistaking it for food, then feed it to their young. 100% of Laysan Albatross carcasses found on Midway Atoll had plastic in their stomachs.

Impacts of Marine Debris

Plastic Debris Impacts All Levels of the Marine Ecosystem



North Pacific Gyre



When plastic debris enters the marine environment, it can get caught up in ocean currents which propel the debris towards the North Pacific Gyre. A gyre is an area formed by circular ocean currents which concentrate plastic and other materials. In all gyres, density of plastic particles increases closer to center. In North Pacific Gyre, the number of plastic particles on surface increased over 1,000% between 1972-2010. In North Atlantic, researchers found 130,000 plastic pieces/KM². The highest sampling showed 26.3 million pieces/KM².

California Coastal Cleanup Day

Coastal Cleanup Day, a major part of the International Coastal Cleanup, engages people to **remove trash** and debris from California's beaches and waterways, to **identify the sources** of the debris, and to **change the behaviors that cause pollution**.



California Coastal Cleanup Day (CCD) is one way to combat against the rising number of trash and litter on our beaches and shorelines. CCD is an annual beach and shoreline cleanup event that engages tens of thousands of people every year and encourages them to think about litter and how we all can play a part in developing solutions.

California Coastal Cleanup Day



The first major Coastal Cleanup took place in 1984 along the Oregon Coast. In 1985, California ran its first CCD – all 15 coastal counties participated. 2,500 volunteers turned out for first event.

California Coastal Cleanup Day



In 2012, 55 of California's 58 Counties participated in the Cleanup, from San Diego County near the Mexico border, all the way to Modoc County which borders Oregon on the north and Nevada on the east, there are cleanup being held along California's coasts, in mountain ranges, and valleys. Over 65,500 people participated!

Coastal Cleanup Day

Results and Solutions



2012 Results (CA)

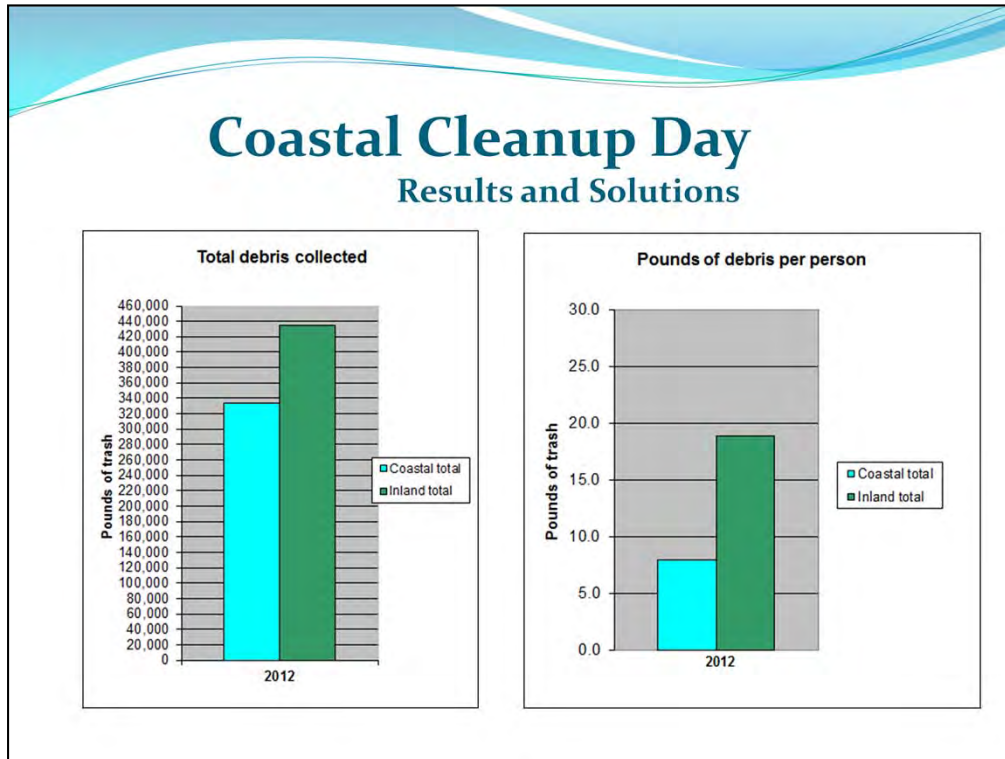
- 65,544 volunteers
- 769,607 pounds of debris removed
- Over 2,008 miles of shoreline cleaned

2012 Results (world-wide)

- **557,692 volunteers!** (California accounts for nearly 12% of worldwide total, and over 40% of US total.)
- **91 participating countries**
- Over **10 million pounds of debris.** (California accounts for 7.6% of worldwide debris.)
- **~17,500 linear miles** of shoreline cleaned.
- Over **2 million cigarette butts** removed.



65,544 people volunteered on Coastal Cleanup Day in California, which represents about 12% of total volunteer participation worldwide). These dedicated volunteers removed over 769,000 pounds of trash and recyclables, which translates to nearly 12 pounds per person! California's event is part of a larger international event organized by the Ocean Conservancy. 91 countries participate in the International effort, including 44 states and the District of Columbia. California has the largest participation, representing nearly 12% of the international totals and over 40% nationwide)



Since The Ocean Conservancy began tracking the sources of marine debris, it has been obvious that the majority of the debris comes from inland sources. Ocean Conservancy and the U.N. both estimate that between 60-80% of all debris picked up on CCD comes from inland sources.

Here are graphs illustrating this point as it relates to California. The graph on the left shows the total amount of debris collected for the coastal versus inland counties. As you can see, the majority of what was collected (according to weight) came from inland waterways (over 800,000 compared to 500,000). When those totals are compared to participation rates, what we see is that with fewer volunteers participating in inland areas, inland volunteers collect over twice what their coastal counterparts do (nearly 19 pounds per person in inland regions and about 8 pounds per person in coastal regions).

Coastal Cleanup Day

Results and Solutions

- Reduced wasteful use of bags and gloves
- Provided reusable buckets and gloves
- Encouraged volunteers to "Bring Your Own"



By promoting a Bring Your Own philosophy, we've encouraged volunteers to bring buckets and gardening gloves from home, drastically reducing the number of virgin bags and gloves needed for the event. To illustrate – since we initiated the Bring Your Own campaign in 2009, we've cut our plastic bag use by 38,355 and our glove use by over 40,880.

Coastal Cleanup Day

Results and Solutions

- In 2011, a pilot program expanded the Cleanup to the boater community
- 2 yacht clubs participated
 - 71 volunteers total
 - 1,265 pounds of debris



In 2011, the Coastal Commission, working with the Department of Boating and Waterways, developed a pilot program to engage participation in Coastal Cleanup Day from the boating community. Cleanup events were held at two locations: Sequoia Yacht Club in San Mateo County and Point Royal Yacht Club in Los Angeles County. Together these two yacht clubs involved 71 volunteers in the Event and collected 1,265 pounds of debris!

Coastal Cleanup Day

Results and Solutions

- Based on successes, boater participation grew! In 2012...
- 23 yacht clubs and marinas participated
 - 827 volunteers total
 - 7,893 pounds of debris removed from shoreline and by watercraft



Due to the success of the pilot program the Coastal Commission and the Department of Boating and Waterways expanded on this program, and sought out additional yacht clubs and marina partners. In 2012, 23 clubs and marinas participated in the event, including:

- Aeolian Yacht Club
- Alamitos Bay Yacht Club
- Andreas Cove Yacht Club
- Ballena Bay Yacht Club
- Ballena Isle Marina
- Dana Point Harbor
- Encinal Yacht Club
- Eureka Marina
- Grand Marina
- Half Moon Bay Yacht Club
- Humboldt Yacht Club
- Long Beach Yacht Club
- Oakland Yacht Club
- Owl Harbor Marina

- Peter's Landing Marina
- Pier 39, San Francisco
- Port Royal Yacht Club
- Santa Monica Windjammers Yacht Club
- Sea Breeze Yacht Club
- Seal Beach Yacht Club
- Sequoia Yacht Club
- Silver Gate Yacht Club
- Sun Harbor Marina



Coastal Cleanup Day 2013

is Saturday, September 21st

Won't you join us?



Coastal Cleanup Day 2012 is just around the corner, on September 21st. We hope you will join us!



CALIFORNIA
COASTAL
COMMISSION

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Photo Credit: 5 Gyres Institute



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For any questions or to learn how to get involved, please contact Shannon Waters or Vivian Matuk, Boating Program Coordinators for Coastal Cleanup Day. Thank you!